

FIG. 1

100

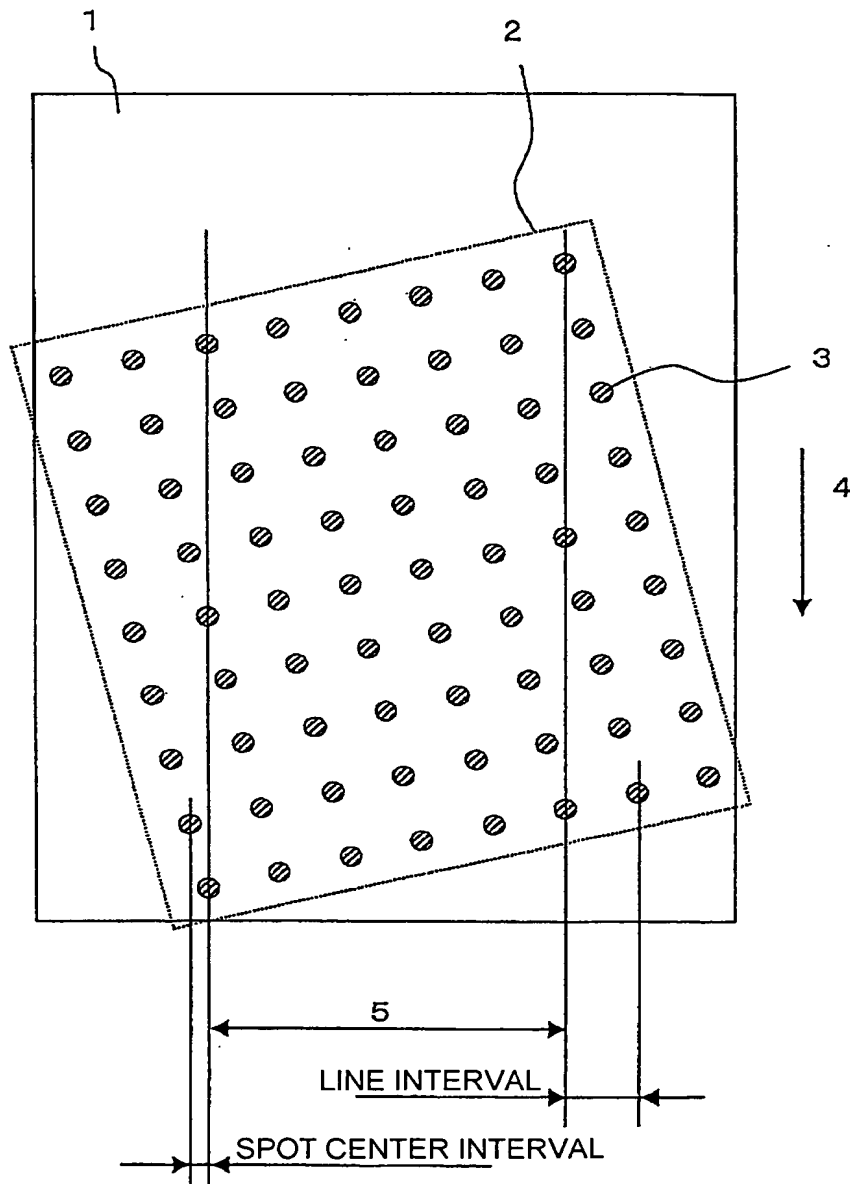


FIG. 2

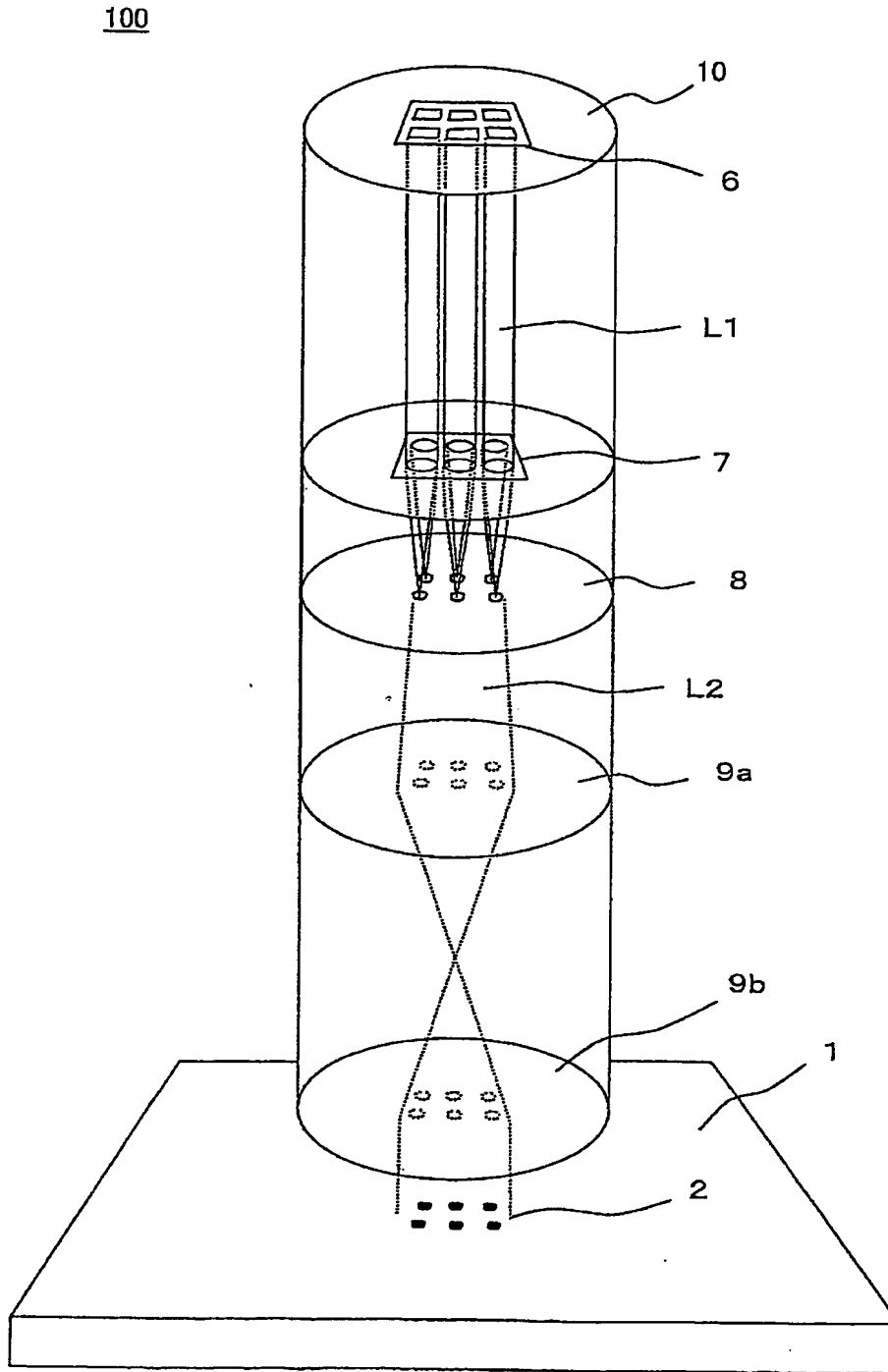


FIG. 3

(a) FORMULAS

SPOT CENTER INTERVAL (D) = $d \cdot G$

NUMBER OF SPOTS BETWEEN LINES (N) = $(Y-1)/(G-1) \sim Y/G$

LINE INTERVAL (S) = $D \cdot N$

EFFECTIVE EXPOSURE WIDTH (W) = $(X-2G) \cdot S$

NUMBER OF SCAN TIMES (m) = XM/W

SCAN SPEED (V) = $D \cdot f$

WRITING TIME (T) = $(YM/V) \cdot m$

(b) EXPLANATION OF SYMBOLS

G : NUMBER OF GRADATIONS

d : MINIMUM GRID SIZE ON SUBSTRATE

(X, Y) : NUMBER OF MICROMIRROR PIXELS
(TRANSVERSE DIRECTION, LONGITUDINAL DIRECTION)

(XM, YM) : WRITING AREA IN SUBSTRATE
(TRANSVERSE DIRECTION, LONGITUDINAL DIRECTION)

f : MICROMIRROR DEFLECTION FREQUENCY (Hz)

(c) DESIGN EXAMPLE

G = 64 GRADATIONS

d = 1.56nm

X = 2048, Y = 512

XM = 132mm, YM = 100mm

f = 2,000Hz

(d) CALCULATION RESULTS

$D = 1.56\text{nm} \times 64 = 0.10\mu\text{m}$

$N \sim 512/64 = 8$

$S = 0.10\mu\text{m} \times 8 = 0.8\mu\text{m}$

$W = (2048 - 2 \times 64) \times 0.8\mu\text{m} = 1.536\text{mm}$

$m = 132\text{mm}/1.536\text{mm} = 86 \text{ TIMES}$

$V = 0.10\mu\text{m} \times 2,000 = 0.2\text{mm/s}$

$T = (100\text{mm}/0.2) \times 86 = 43000\text{s} \sim 12\text{h}$

FIG. 4

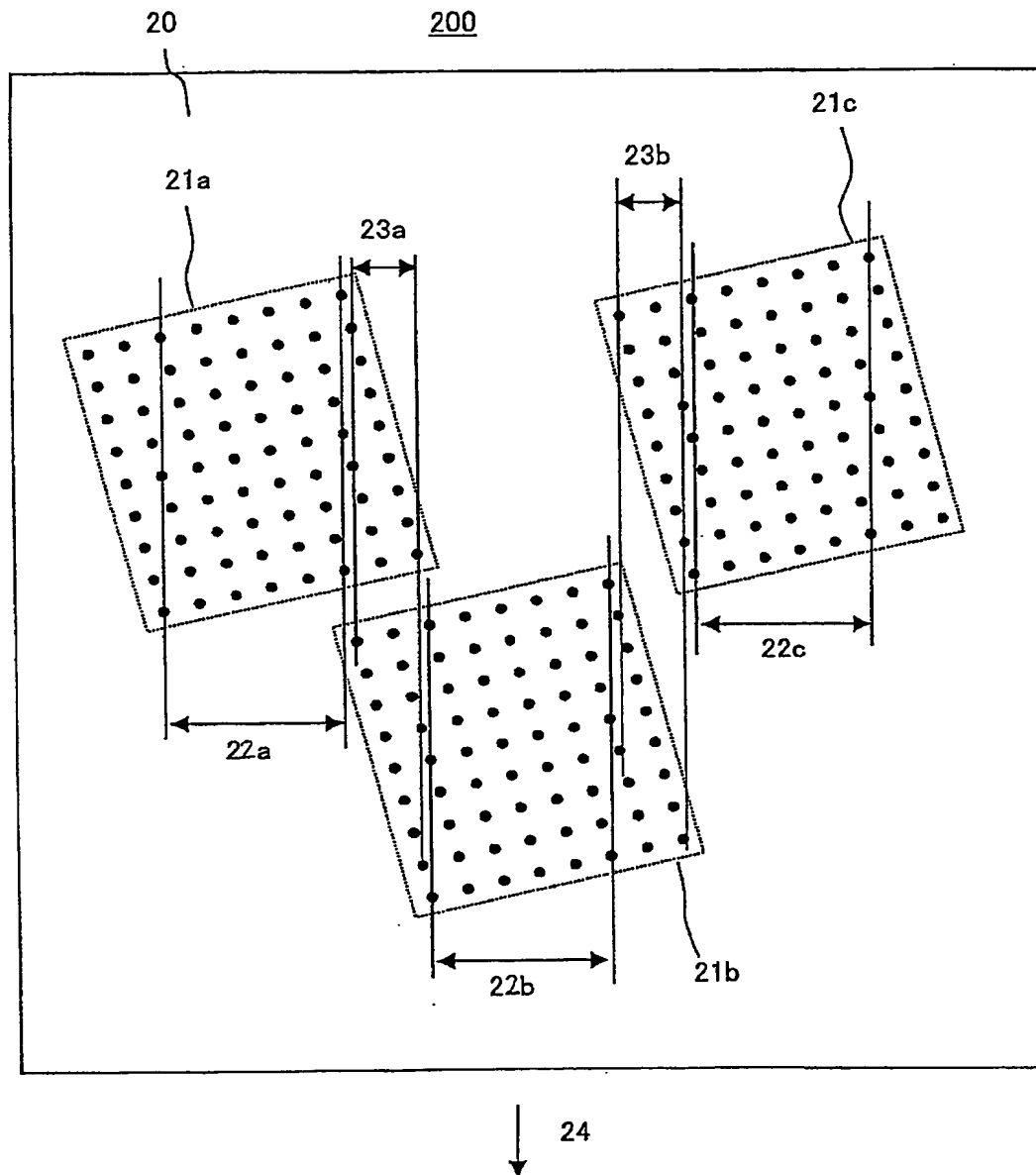
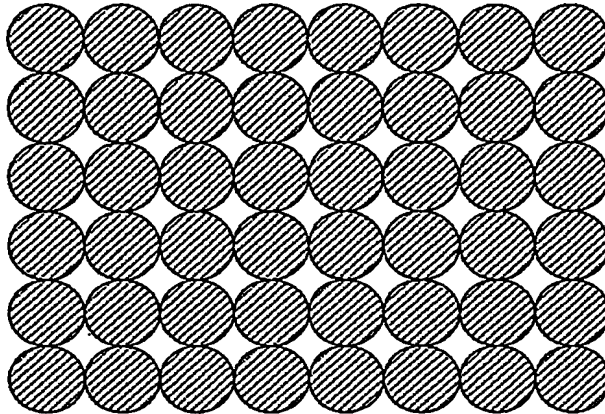


FIG. 5

(a)



(b)

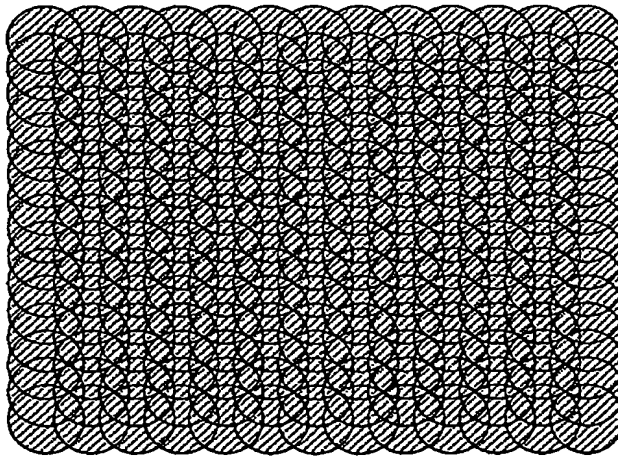


FIG. 6

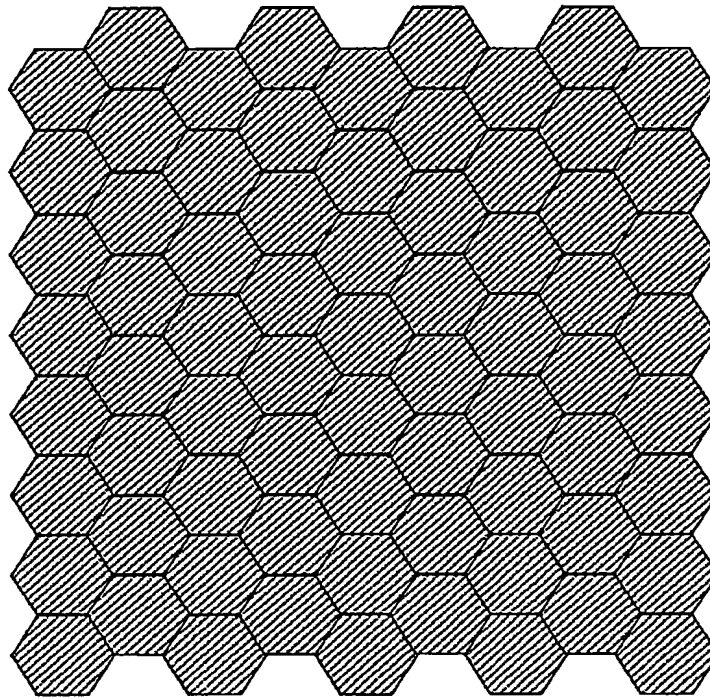


FIG. 7

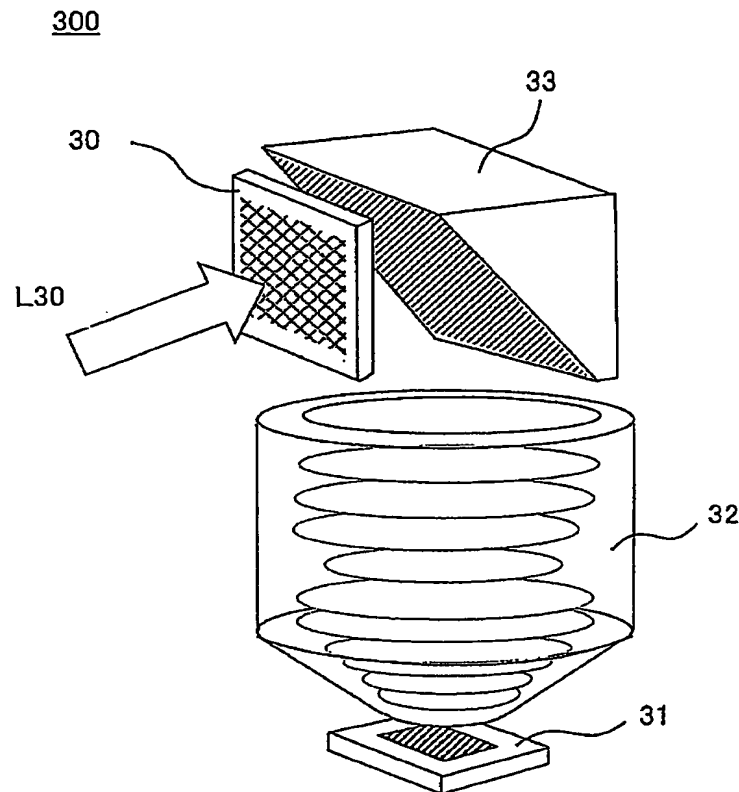


FIG. 8

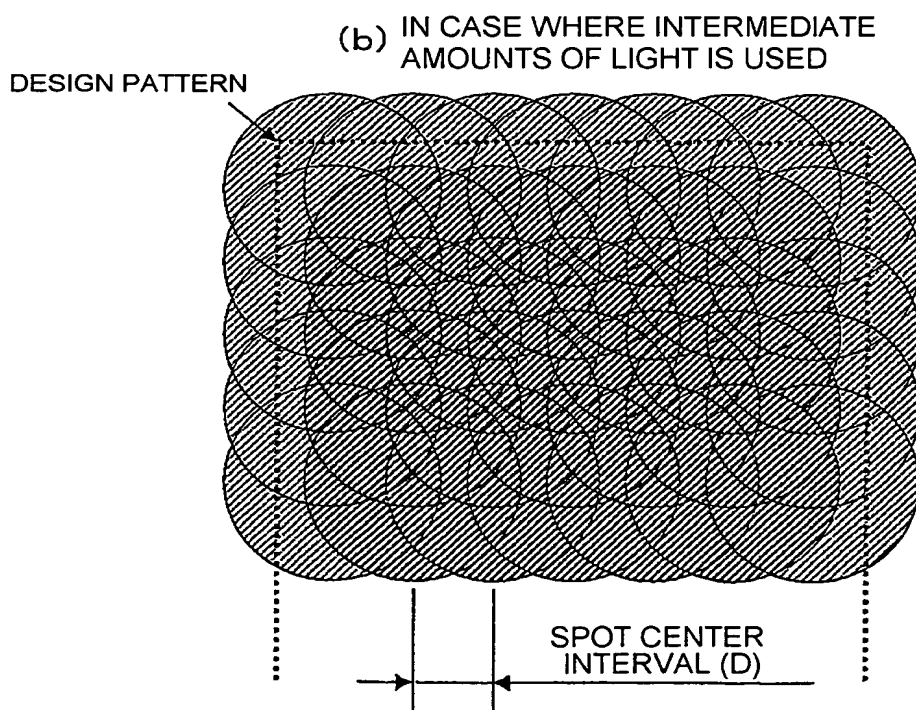
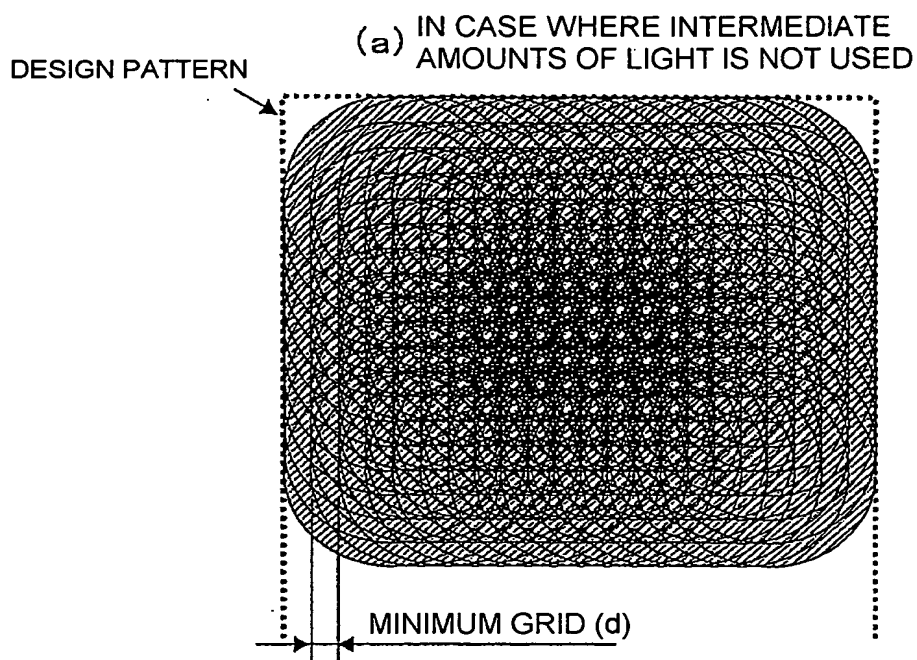


FIG. 9

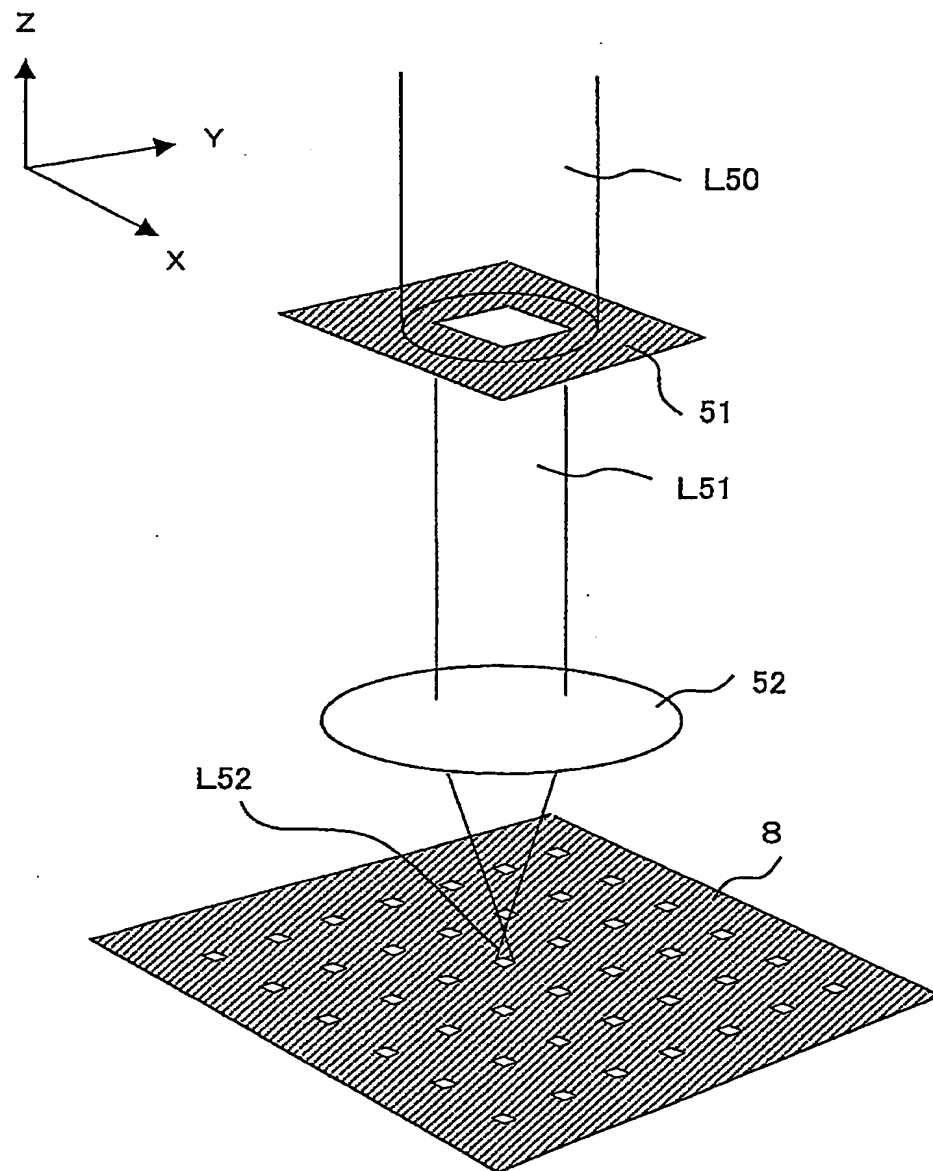


図 10

100

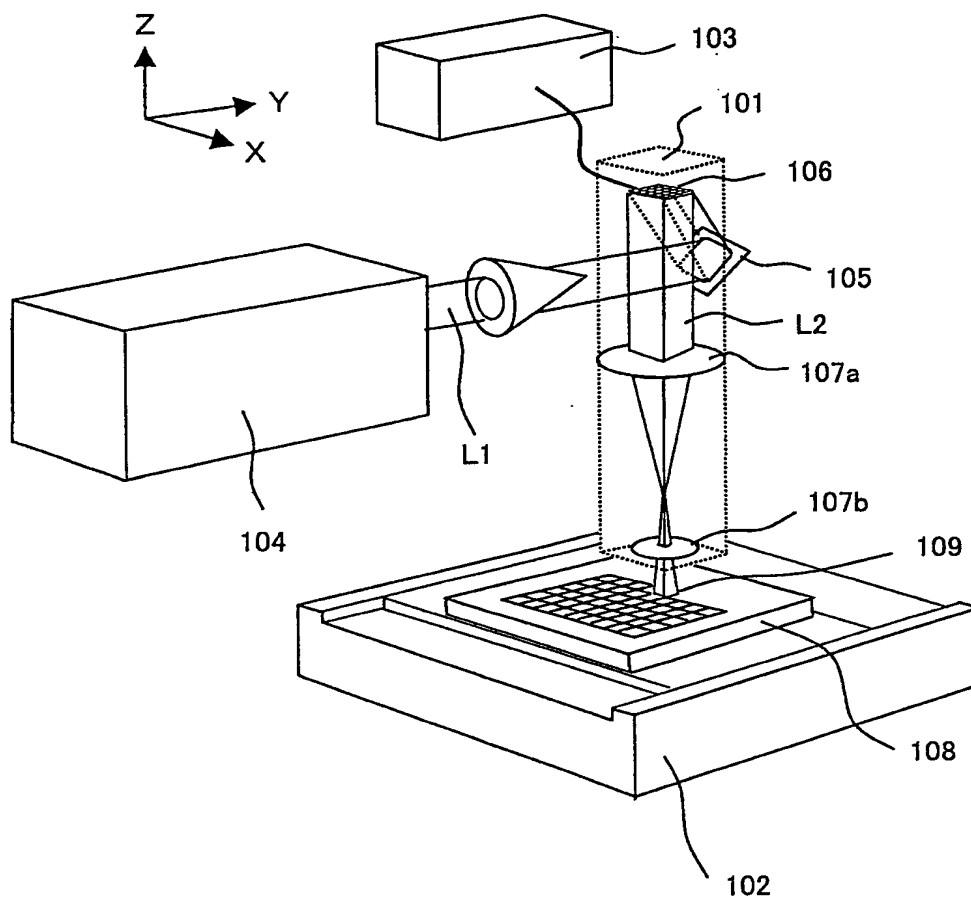


FIG. 11

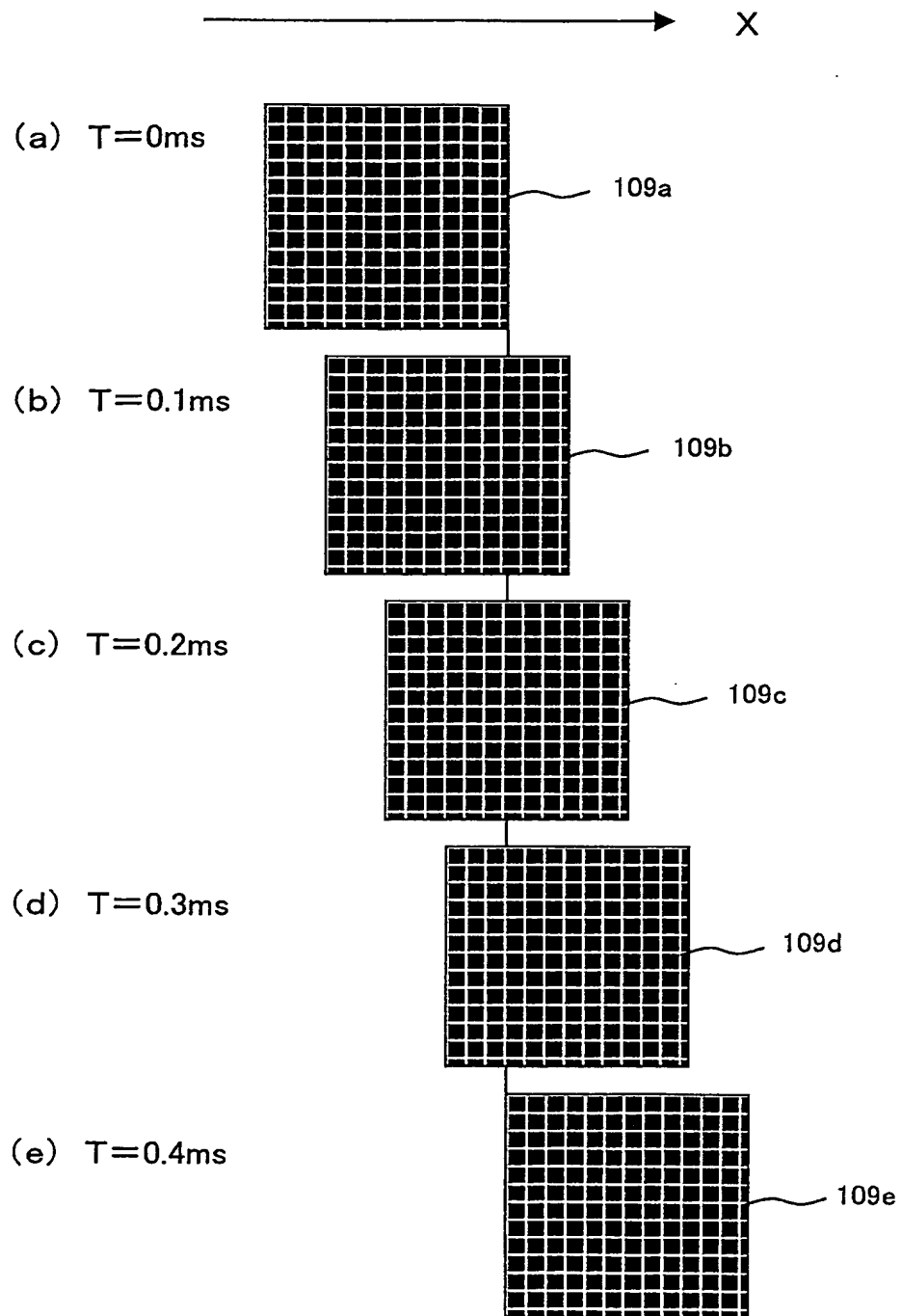
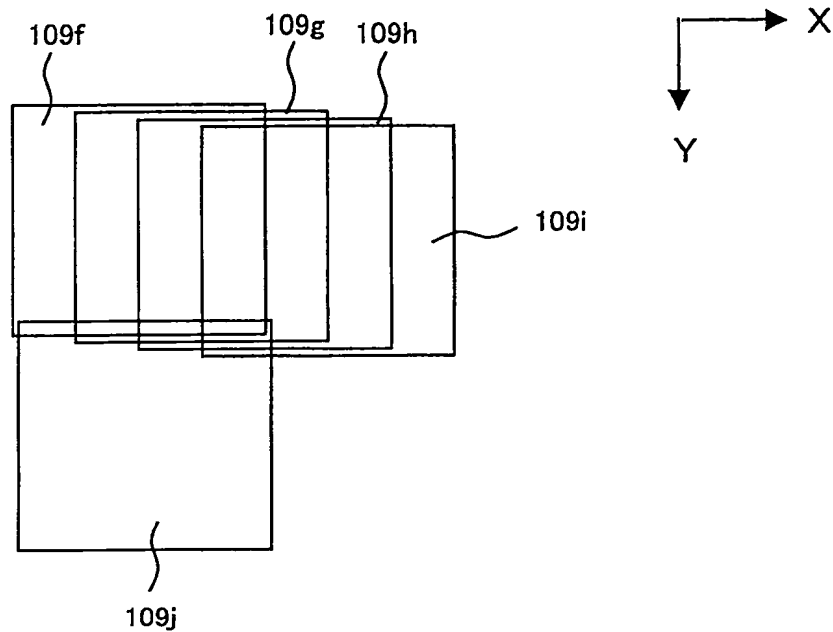


FIG. 12

(a)



(b)

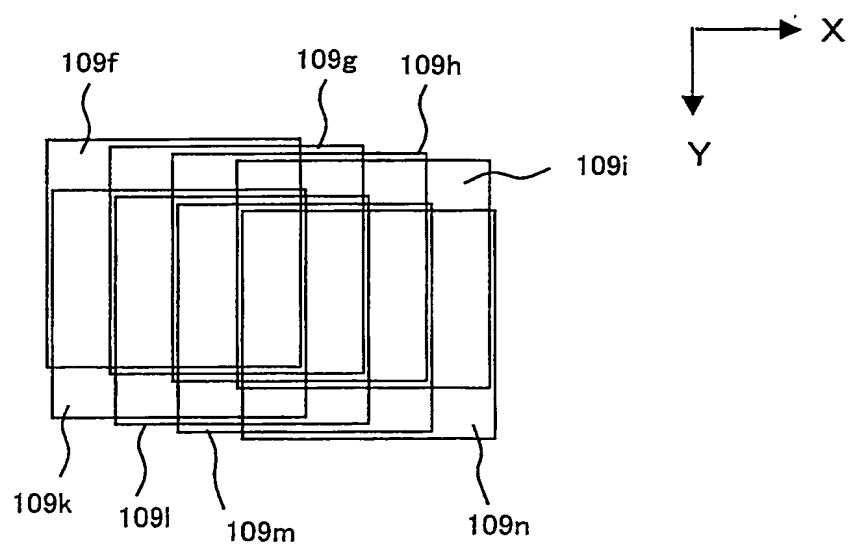


FIG. 13

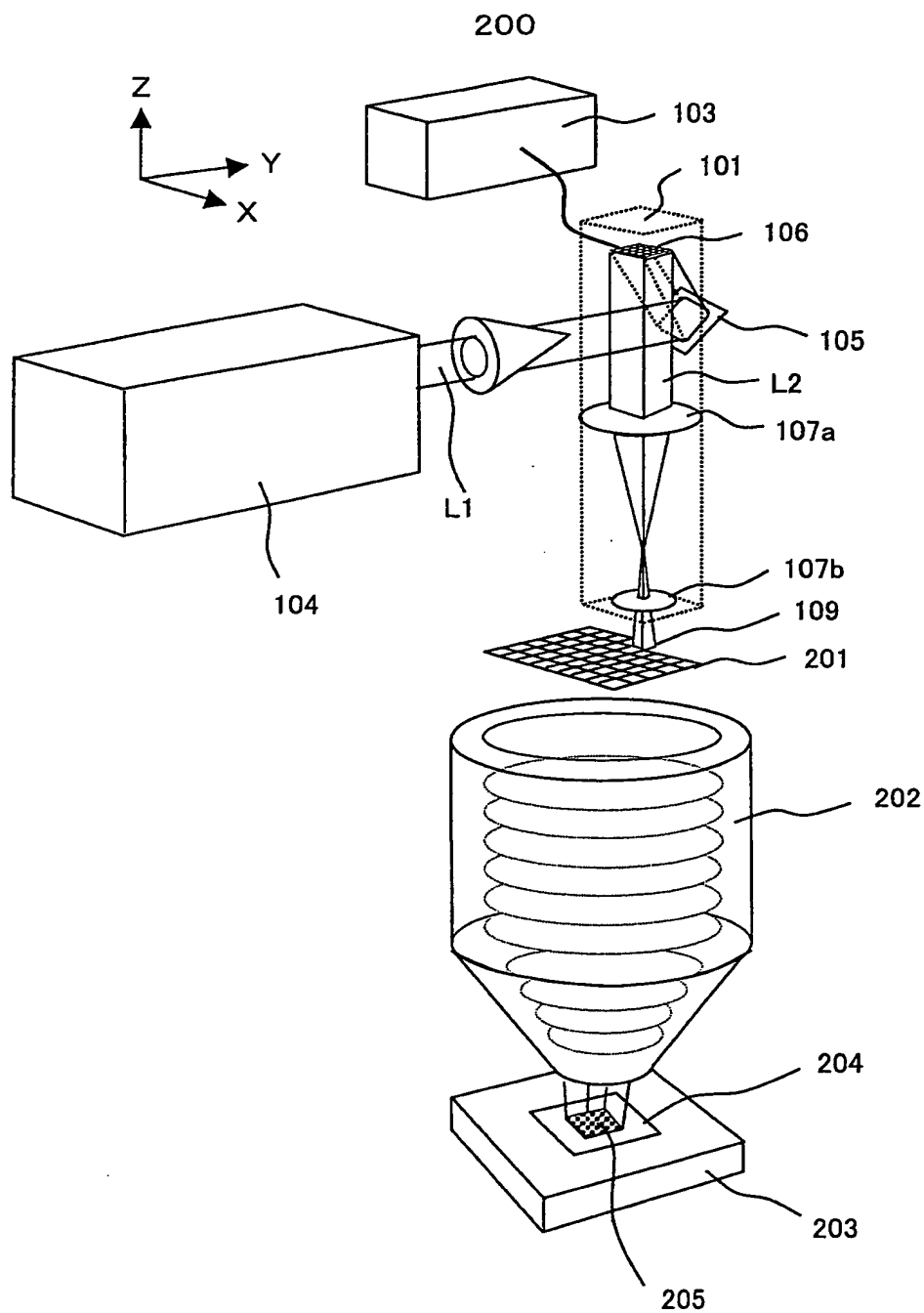


FIG. 14

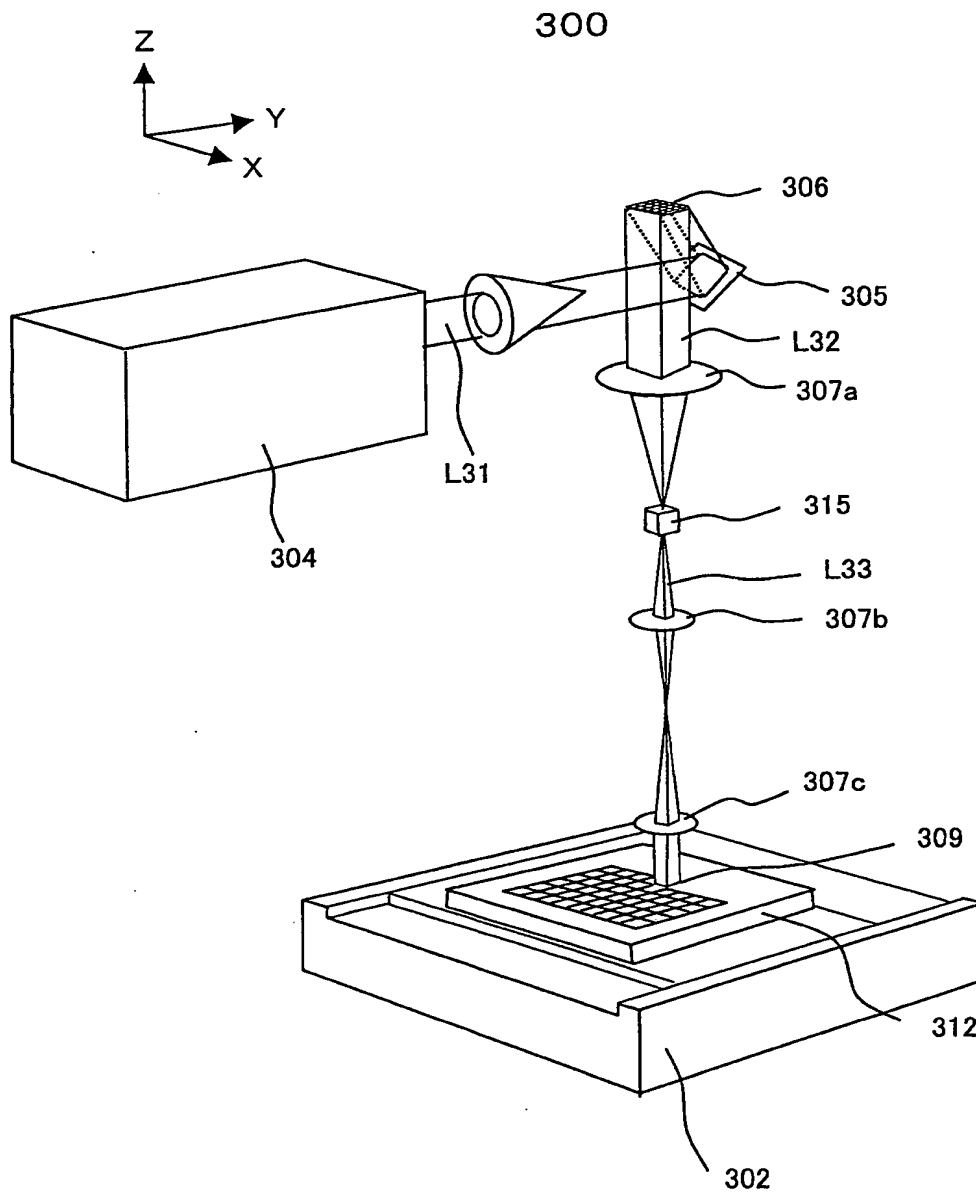


FIG. 15

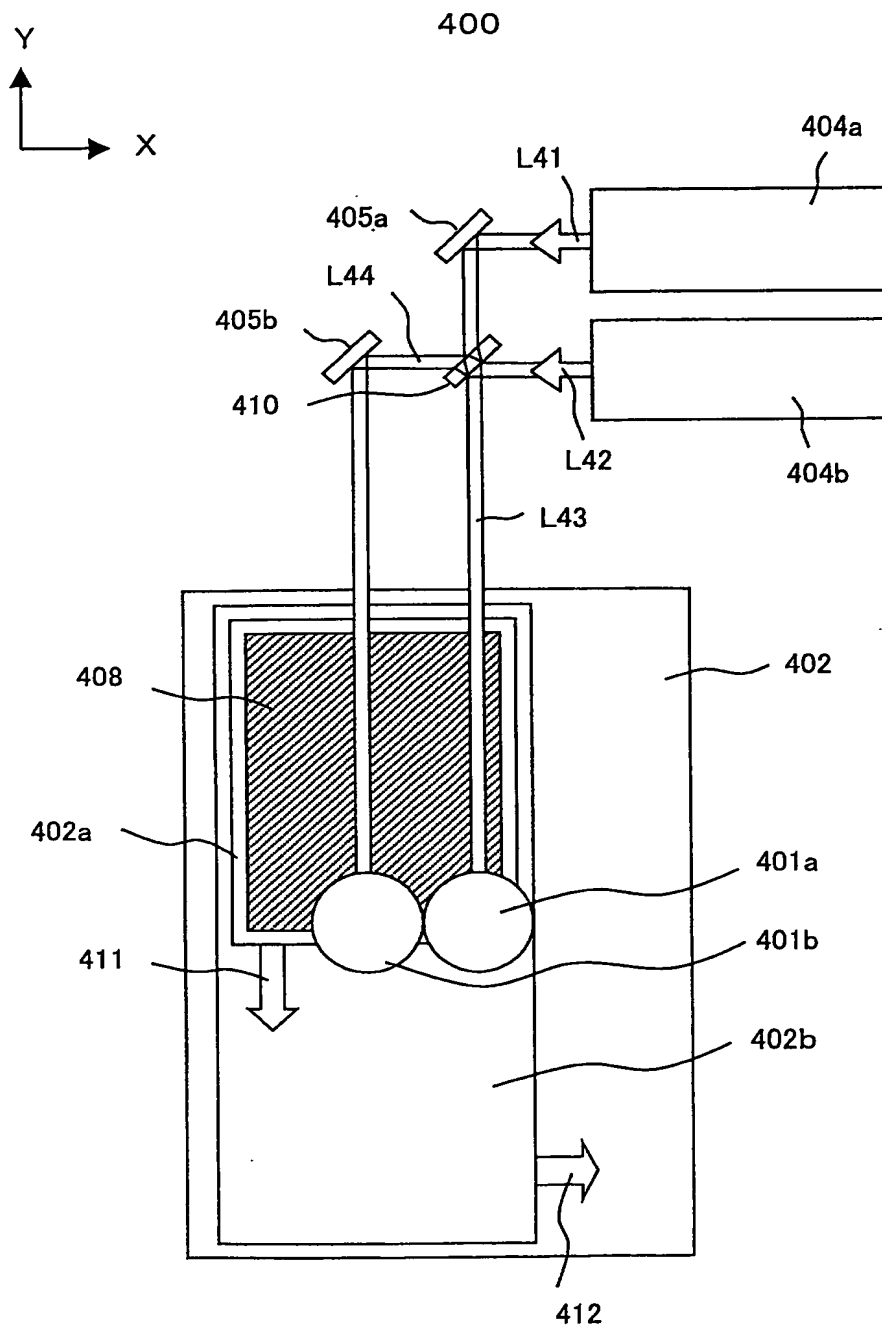
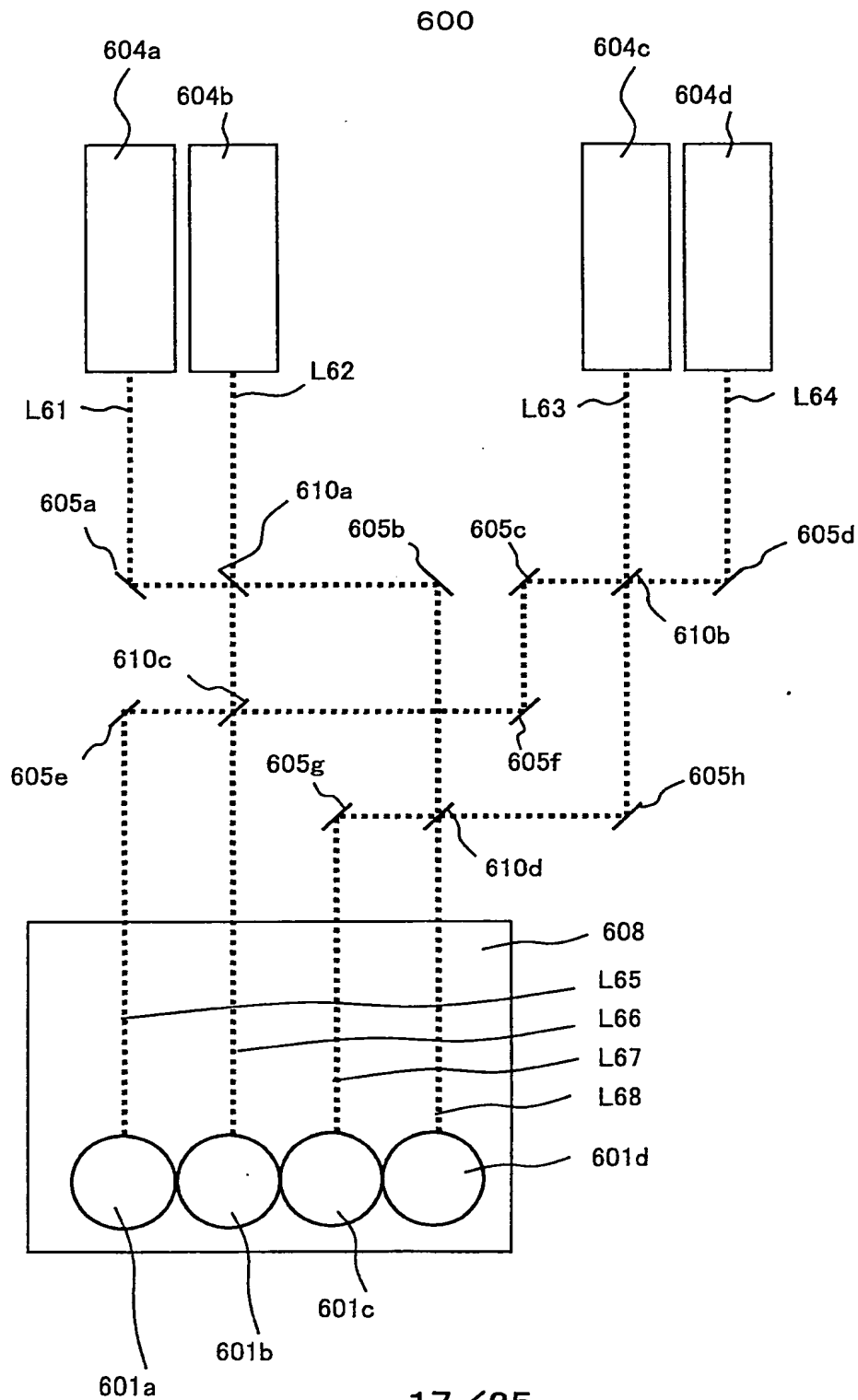


FIG. 17



100

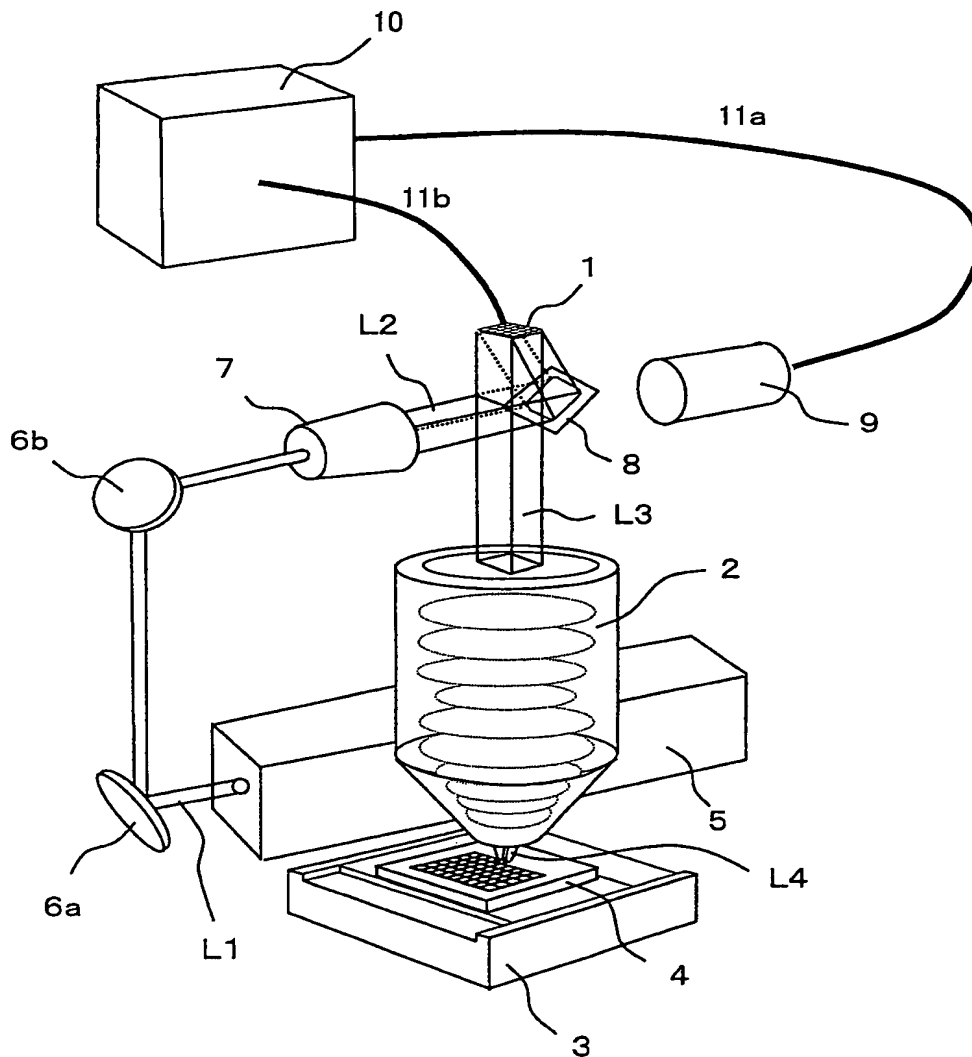


FIG. 19

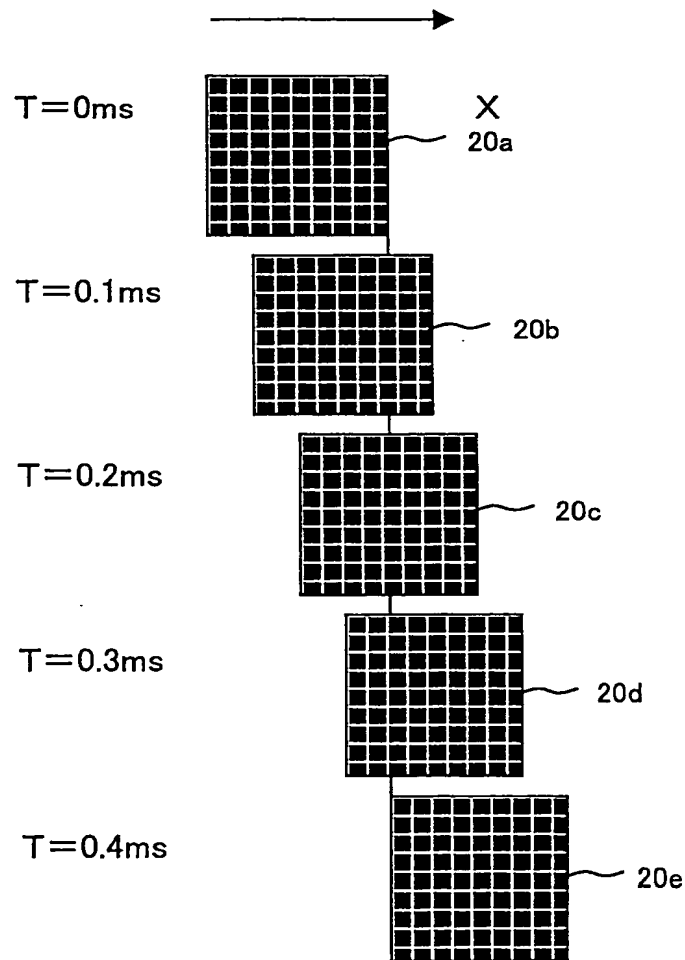
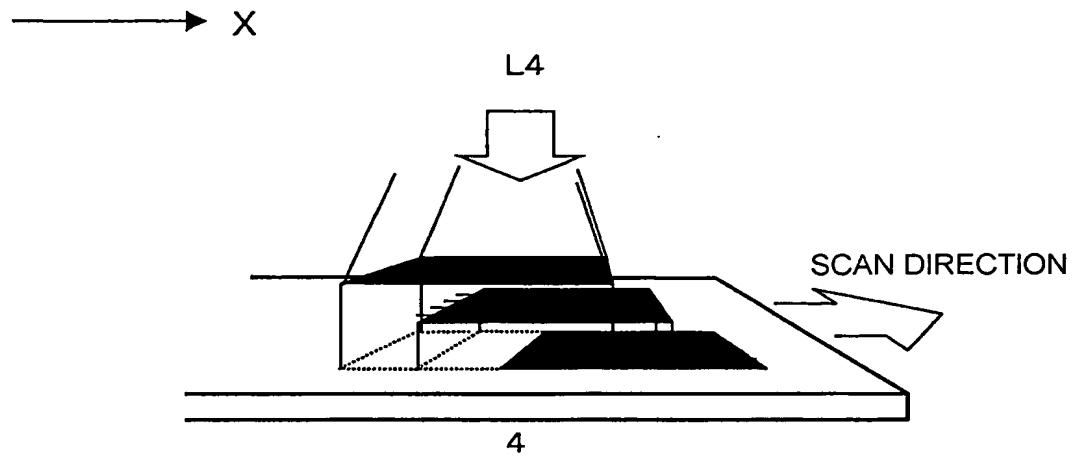
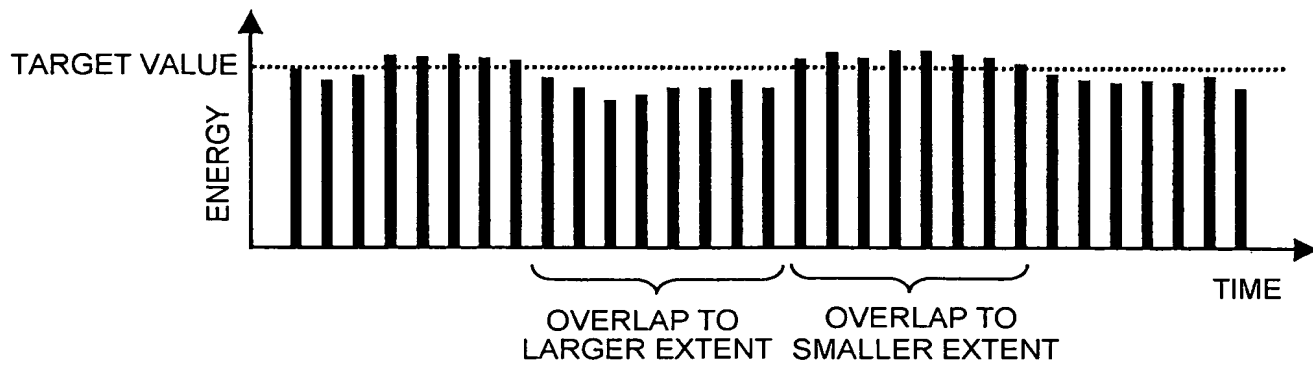


FIG. 20



200

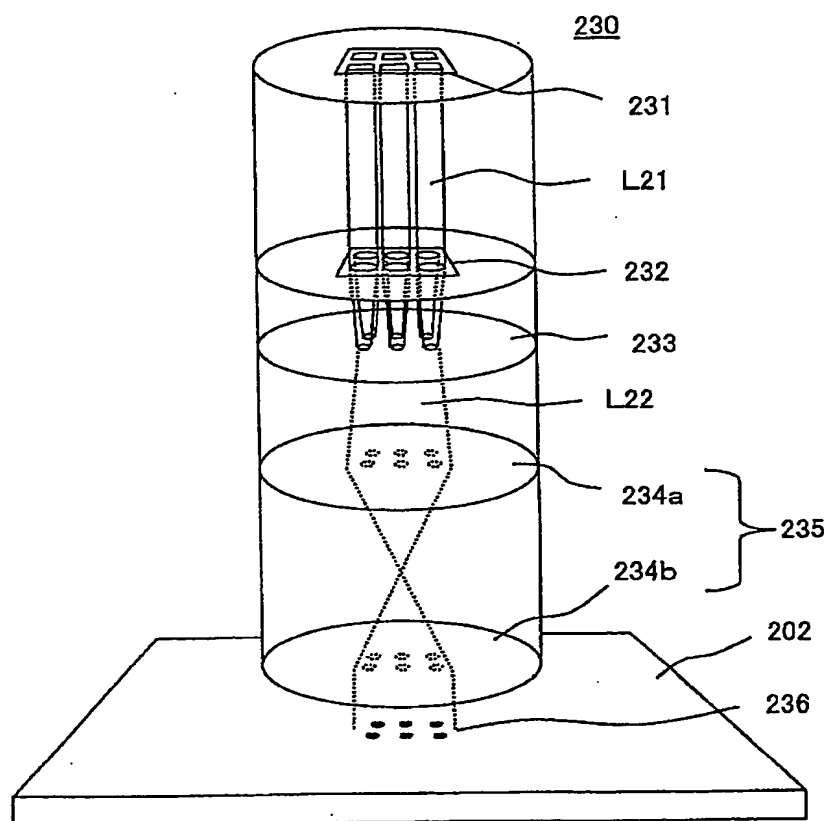


FIG. 22

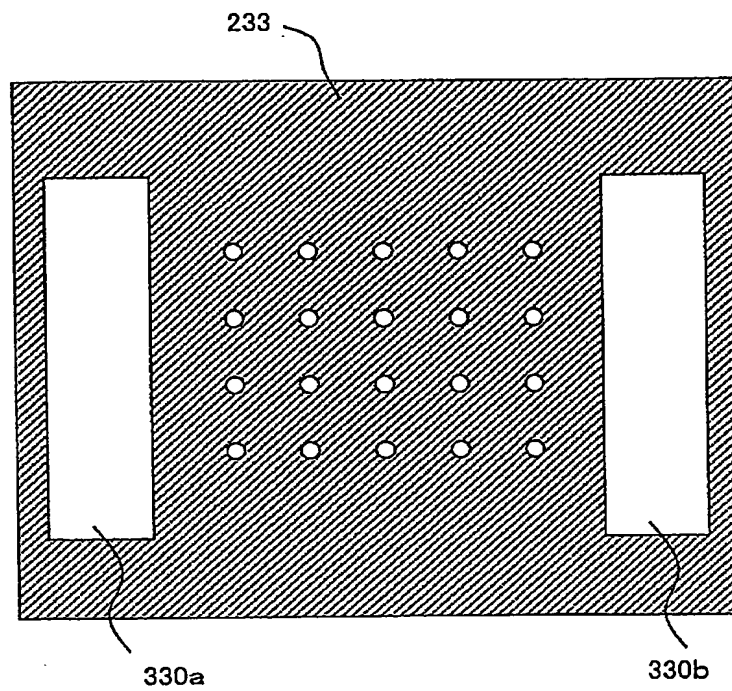


FIG. 23

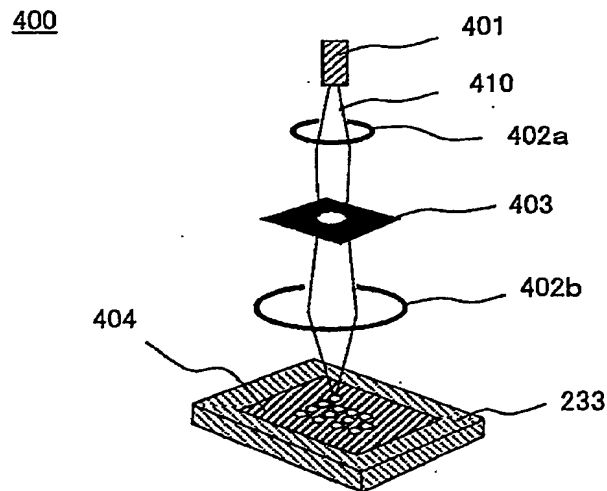


FIG. 24

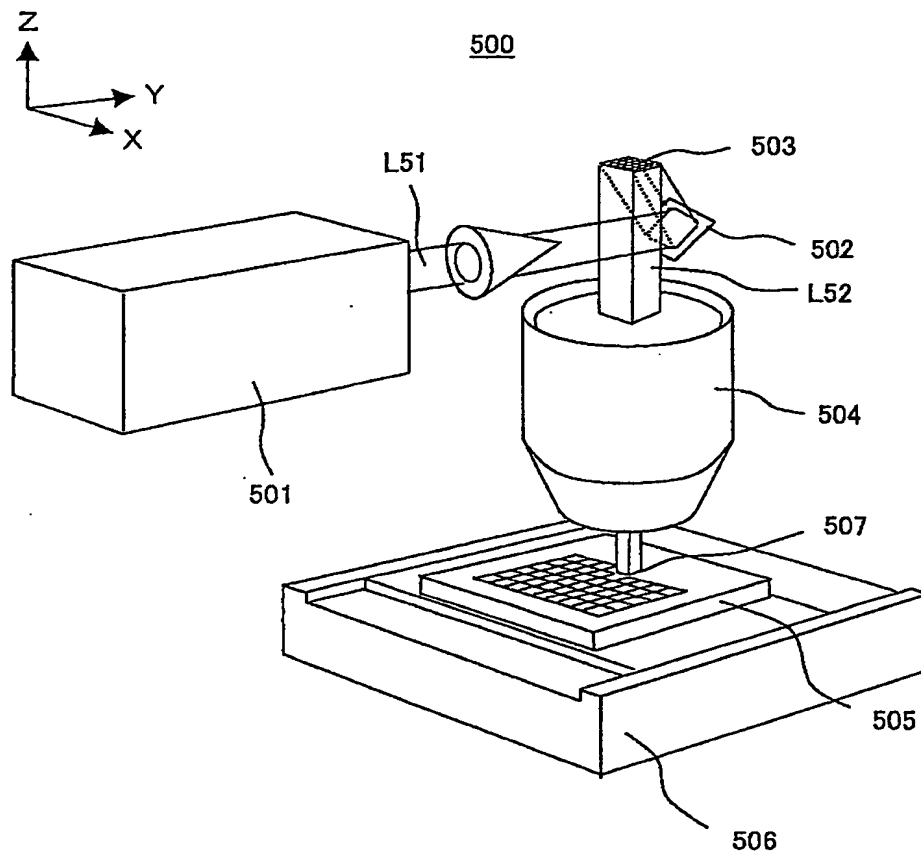


FIG. 25

